

Appln No. 09/403,472
Amdt dat August 8, 2003
Reply to Office action of May 8, 2003

REMARKS/ARGUMENTS

The Applicants have carefully studied the outstanding Office Action. The applicants have amended independent claims 1 and 20 by incorporating therein the subject matter of claim 16, which the applicants have cancelled without prejudice. Additionally, the applicants have amended claim 21 to more clearly claim the subject matter thereof. The present amendment is intended to be fully responsive to all points of objection and rejection raised by the Examiner, and is believed to place the application in condition for allowance. Favorable reconsideration and allowance of the application are respectfully requested.

Claim rejections - 35 USC § 102

Claims 1, 2, 4, 5, 7, 11, 12, 14-22, 24-28 are rejected under 35 USC § 102(e) as being anticipated by Leger (U.S. Patent No. 5,745,511). The Examiner states that "Figure 4A illustrates a static discontinuous phase plate (129) placed between reflectors (124, 121) within a resonator of a laser system to provide phase adjustment and modal discrimination. As disclosed in column 7, lines 39-50, custom phase- adjustment element 129 provides enhanced modal discrimination by introducing a phase shift, which varies in a pseudo-random manner which implies discontinuity as shown in the figure with the sharp peaks and the discontinuous shape."

The applicants respectfully submit that the phase plate 129 described in the Leger reference is quite different from

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that of the discontinuous phase element claimed in the present Application, both in construction and in function.

In the Leger disclosure, there is described a laser resonator with a phase conjunction diffractive mirror 124 as the full reflector of the resonator. In Fig. 4A, there is added an optional custom phase adjustment element (129), as described in column 7, lines 39-50 of the Leger disclosure, used to enhance modal discrimination of the laser resonator system by introducing varying amounts of phase shift into various portions of the cross section of the beam. The custom phase adjustment element 129 of the Leger disclosure is described as introducing a phase shift which varies in a **pseudo-random** manner (Emphasis added). The method of construction of such a pseudo-random phase shifting plate is described in col. 7 line 63 to col. 8 line 3 of the Leger patent, and is essentially iterative, inspecting the mode obtained while adjusting the phase profile of the element in a random manner, as follows:

" calculations of the modal discrimination which would be obtained by a number of different random phase patterns for custom phase-adjustment element 129 are performed. In one embodiment, the phase patterns are generated using different "seeds" in a random number generator. The random pattern generating the largest calculated modal discrimination is then used to fabricate custom phase-adjustment element 129."

→ In contrast to the methods of the Leger patent, the present claimed invention involves the use of a predetermined discontinuous phase element, whose structure is generally known

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in advance, and which is inserted into the resonator in such an alignment that its at least one sharp discontinuity falls in a region of low intensity of the mode which it is desired to preferentially propagate in the resonator. In claiming this invention, amended claims 1 and 20 of the present application recite that the discontinuous phase element "is aligned such that said at least one sharp discontinuity falls in a region of low intensity of a desired mode propagating in said resonator". Nowhere, to the best of the applicants' understanding, is there described or suggested in the Leger prior art, the alignment of a discontinuous phase element such that its at least one sharp discontinuity falls in a region of low intensity of a desired mode propagating in the resonator.

It is therefore respectfully submitted that independent claims 1 and 20 are not anticipated by Leger, and are thus allowable. Claims 2, 4, 5, 7, 11, 12, 14-19, 21-22, and 24-28 are dependent from either of claims 1 or claim 20, and recite further patentable subject matter. Since claims 1 and 20 are now deemed to be allowable, claims 2, 4, 5, 7, 11, 12, 14-19, 21-22, and 24-28 are also deemed to be allowable.

Claim Rejections - 35 U.S.C. § 103

Claims 3, 6, 8-10, 13 and 23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Leger (U.S. Patent No. 5,745,511), Fink (U.S. patent No. 5,283,796) and Harris (U.S. patent No. 3,605,039).

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Claims 3, 6, 8-10 and 13 are dependent from amended claim 1, and recite further patentable subject matter, and claim 23 is dependent from claim 20, and recites further patentable subject matter. Since amended claims 1 and 20 are now deemed to be allowable, claims 3, 6, 8-10, 13 and 23 are also deemed to be allowable.

The applicants therefore respectfully submit that claims 3, 6, 8-10, 13 and 23 are believed to be free of the grounds of rejection under 35 U.S.C. 103(a). Withdrawal of such rejection is respectfully requested.

New Claim

The applicants are adding new claim 29, which is dependent on claim 11 and recites the additional limitation that the discontinuous phase element is disposed adjacent to the output coupler of said optical resonator, such that essentially all parts of an output beam of a desired mode of the resonator are in phase. Support for this claim is to be found in the specification on page 6, lines 3-5 of the last paragraph, on page 11, lines 1-2 of the last paragraph, and on page 12, lines 4-6 of the last paragraph.

Request for Consideration of Information Disclosure Statements

Applicants have not received acknowledgement that the Examiner has considered the Information Disclosure Statement applicants filed on May 31, 2000. Applicants also recently

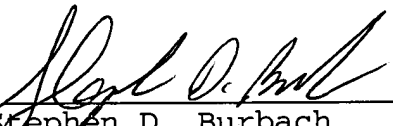
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filed Information Disclosure Statements on May 20, 2003 and July 23, 2003. Applicants request the Examiner to provide with the next official paper an acknowledgement that all of the references in these Information Disclosure Statements have been considered.

Conclusion

For all of the reasons set forth above, applicants respectfully submit that all of the claims are now believed to be allowable. Reconsideration and prompt allowance of this application are therefore respectfully requested.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By 
Stephen D. Burbach
Reg. No. 40,285
626/795-9900

SDB/dlf

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